WHAT IS CLAIMED IS:

1.   A digital imaging device comprising:

a substrate;

5   a sensor array formed on the substrate, the array generating an electrical

signal corresponding to the amount of light impinging upon the array; and

imaging logic formed on the substrate, coupled to the sensor array and

receiving the electrical signal, the imaging logic including

an analog to digital converter receiving the electrical signal and

10   outputting digital pixel values; and

a defective pixel filter receiving the digital pixel values and detecting

defective pixels on the basis of variations between a selected pixel value

and its neighboring pixel values.

15   2.   The digital imaging device of claim 1 further comprising:

a corrected pixel value calculator receiving as input the neighboring pixel

values and outputting a corrected pixel value.

3.   The digital imaging device of claim 1 further comprising:

20   a first in first out register wherein said pixel values are stored.

4. The digital imaging device of claim 1 wherein the defective pixel filter and the corrected pixel value calculator operate in real time.

5. The digital imaging device of claim 1 wherein the sensor array is comprised of CMOS cells.

6. The digital imaging device of claim 1 wherein the digital pixel values are ten bit values.

7. The digital imaging device of claim 1 wherein the defective pixel filter comprises:

means for detecting whether the selected pixel is outside an acceptable range defined by its neighboring pixel values;

means for determining whether the selected pixel deviates from a first neighboring pixel by greater than a threshold value; and

means for determining whether the selected pixel deviates from a second neighboring pixel by greater than a threshold value.

8. The digital imaging device of claim 7 wherein the threshold value is a pre-determined value stored in a register.

9. The digital imaging device of claim 7 wherein the threshold value is selected by an end-user.

10. The digital imaging device of claim 7 wherein the threshold value if determined from a feedback signal indicative of image quality.

11. A method for detecting a defective pixel based upon the luminance values generated by the pixel element and its two nearest neighbors comprising:

determining a first difference value between the luminance value of the pixel

5 and the luminance value of a first neighboring pixel;

comparing the first difference value to a pre-determined threshold value;

determining a second difference value between the luminance of the pixel and the luminance value of a second neighboring pixel;

comparing the second difference value to the pre-determined threshold

10 value;

detecting whether the luminance value for the pixel falls within an acceptable range defined by the luminance value for the first neighboring pixel and the luminance value for the second neighboring pixel; and

identifying the pixel element as defective if the luminance value for the pixel

15 element does not fall within the acceptable range and neither the first difference value nor the second difference value is less than or equal to the threshold value.

12. The method of claim 11 further including the step of:

calculating a corrected luminance value for the pixel element; and

20 substituting the corrected luminance value in place of the luminance value of the pixel element.

13. The method of claim 12 wherein the corrected luminance value is the average of the luminance value of the first neighboring pixel element and the luminance value of the second neighboring pixel element.

14. The method of claim 12 wherein the corrected luminance value is determined by interpolating over two or more neighboring pixels on either side of the pixel.

15. The method of claim 11 wherein said threshold value is stored in a register.

16. The method of claim 11 wherein said threshold value is determined from a feedback signal indicative of image quality.

17. The method of claim 11 wherein said luminance value is a ten bit digital value.

18. The method of claim 11 wherein said method steps are performed in real time.

19.   A defective pixel filter comprising:

a first comparator circuit receiving as input a first pixel value and a second

pixel value and outputting a valid logic signal to a first input of an AND circuit

and to a first inverter when the first pixel value is greater than the second

5   pixel value;

a first difference calculator receiving as input said first pixel value and said

second pixel value and outputting to a first input of a second comparator

circuit a first difference value corresponding to the difference between said

first and second pixel values;

10   said second comparator circuit also receiving as input a threshold value and

outputting a valid logic signal to a first input of an OR circuit when the first

difference value is less than or equal to said threshold value;

a third comparator circuit receiving as input said second pixel value and a

third pixel value and outputting a valid logic signal to a second input of said

15   first AND circuit and to a second inverter when the second pixel value is

greater than the third pixel value; and

a second difference calculator receiving as input said second pixel value

and said third pixel value and outputting a second difference value

corresponding to the difference between said second and third pixel values

20   to a first input of a fourth comparator circuit;

said fourth comparator circuit also receiving as input a threshold value and outputting a valid logic signal to a third input of said OR circuit when the second difference value is less than or equal to said threshold value; and

a second AND circuit coupled to said first and second inverters and having an output coupled to a fourth input of said OR circuit.

20. The defective pixel filter of claim 19 further comprising:

a corrected pixel calculation block receiving as input said first and third pixel values and outputting a corrected pixel value;

a multiplexer having a first input coupled to the output of said corrected pixel calculation block, and receiving as a second input said pixel value, and having a control input coupled to an output of said OR circuit.

21. The defective pixel filter of claim 19 further comprising registers for storing pixel values.

22. The defective pixel filter of claim 19 being operative in both monochrome and color mode and further comprising at least one multiplexer receiving as input the pixel values stored in at least two registers, and outputting one of said pixel values in response to an indication of monochrome or color mode operation.

23. The defective pixel filter of claim 19 wherein said first, second, and third pixel values are ten bit digital values.

24.   The defective pixel filter of claim 19 further comprising a threshold value register in which is stored said threshold value.

25.   The defective pixel filter of claim 19 wherein said comparator circuits, difference calculators, and registers are fabricated with CMOS processes.

26.   The defective pixel filter of claim 19 wherein said comparator circuits and difference calculators are formed by a general purpose microprocessor running programmed instructions.

27.   A digital imager comprising:

a lens mechanism;

a sensor array positioned within a focal plane of said lens mechanism;

an analog buffer and amplifier coupled to an output of said sensor array;

5   and

imaging logic coupled to said amplifier;

wherein said imaging logic includes a defective pixel filter comprising:

means for detecting whether a first pixel is outside an acceptable

range defined by luminance values of first and second neighboring pixels;

10   means for determining whether said first pixel deviates from said first

neighboring pixel by greater than a threshold value and means for

determining whether said first pixel deviates from said second neighboring

pixel by greater than a threshold value;

means for calculating a corrected pixel value; and

15   means for substituting said corrected pixel value for said first pixel if

said first pixel is outside said acceptable range and said first pixel deviates

from said first neighboring pixel by greater than a threshold value and said

first pixel deviates from said second neighboring pixel by greater than a

threshold value.

20   28.   The digital imager of claim 27 further including:

a microprocessor coupled to said imaging logic and providing thereto control signals.

29. The digital imager of claim 27 further including:

an input / output port coupled to said microprocessor and said imaging logic;

30. The digital imager of claim 27 wherein said sensor array and said imaging logic are fabricated on a single integrated circuit.

31. The digital imager of claim 27 wherein the sensor array is comprised of CMOS cells.

32. The digital imager of claim 27 wherein the sensor array is comprised of CCD cells.

33. The digital imager of claim 27 wherein the imaging logic is realized in combinational logic.

34. The digital imager of claim 27 wherein the imaging logic is realized in a microprocessor operating in response to programmed instructions.